TWO DIMENSIONAL INSTRUMENTS, LLC

Internal temperatures of refrigerators

There is a lot of misunderstanding about the internal temperature of refrigerators. Most people believe that the temperature inside a refrigerator is uniform through the entire storage space and that any two temperature sensors will always show identical temperatures.

Refrigerators are cooled by compressors which produce cool air. The cool air is moved around the internal space by one or more fans. If the internal space was empty the temperature might be the same through the entire space, but refrigerators are made to store things and to cool things. As soon as you put even one small box inside the refrigerator you have disrupted the air flow and almost guaranteed that there will be colder and warmer areas. And, what is more, if the thing you put inside the refrigerator was warmer than the refrigerator, you can be sure the air near the object be at least a little warmer until it cools to the same temperature as the air in other areas of the refrigerator.

There are a number of events that can create uneven temperatures in a refrigerator:

1. Obstructing the air flow of the fans
2. Loading the refrigerator with warm boxes or products
3. Position of boxes or product
4. Opening and closing the door.
5. Incorrectly designed fans
6. Fans wearing out

There are even more reasons two different sensors might measure different temperatures:

1. Different types of sensors. i.e. bimetal strips, digital sensors, thermistor, thermocouples.
2. Different rates of averaging
3. Sensors out of calibration

I have received phone calls from two customers in the last two days complaining that the TV2 was not showing the ‘correct temperature’. In each case the 2di sensor was placed inside the refrigerator in one area and the other temperature sensor was installed in a different area. In one case, the TV2 sensor was positioned near the left wall of the refrigerator about ½ distance between the top and the bottom and midway

between the front and the back of the refrigerator. The 2nd sensor was at the back of the refrigerator near the top of the unit.

They were only about three feet apart and you would think the temperature in the two area would be the same. But that was and almost never is the case. In this instance there was a 2° to 3° difference in temperature.

We suggested that they place the two sensors side by side, even placing a rubber band around them and then look at the temperature. When they did place the two sensors side by side they both showed the same temperature; within 0.5°C of each other.

In this case a repairman advised that they purchase a newer sensor. That was not necessary and would have been a waste of money. The problem was not the sensor but the position of the sensor.

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